

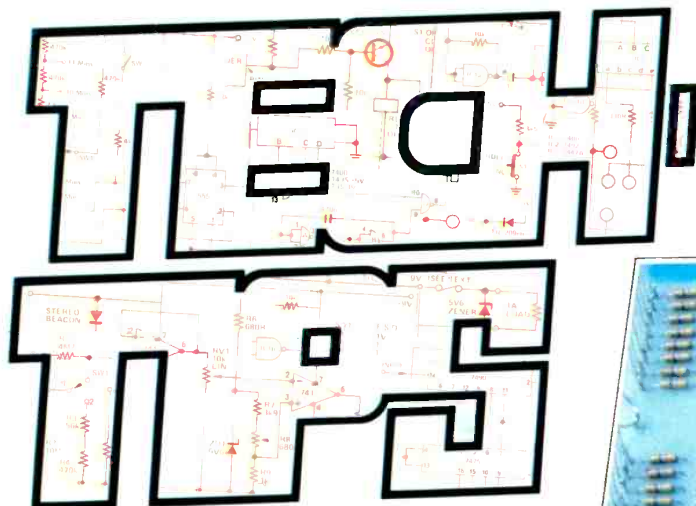
electronics today

NOVEMBER 1979

INTERNATIONAL

50p

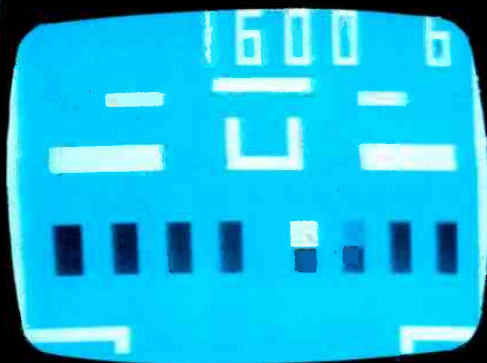
8 PAGE
SPECIAL



**2 Wire
Model Train
Controller**



**Pinball
TV Game**



ETI DOES IT AGAIN!

**SEIKO 45%
CALCULATOR WATCH OFF**

... NEWS ... PROJECTS ... MICROPROCESSORS ... AUDIO ...

PINBALL TV GAME

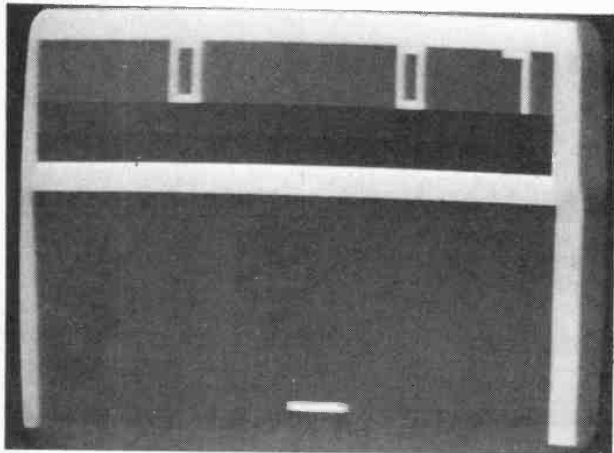
A dedicated chip TV game may seem strange in these days of the programmable? It won't when you consider the unique games and the fact that this EXCLUSIVE ETI PROJECT will only ever be built by 500 people.

THIS TV GAME is a 'dedicated chip' version of a game which has been available on cartridge models for some time — breakout. In addition to this, however, there are four pinball games and two solo 'basketball' type of game which are rare — if not unique. The breakout is highly addictive we warn you — it has amazing potential for stopping all life beyond the paddle control. And as only 500 of the chips are available, the Jones's will have some trouble keeping up! The pinball games are available in both flipper and paddle options — and also a small bat option for inflicting greater frustration upon oneself.

Breakout!

Undoubtedly our favourite game was the breakout. It comes in four options, of which the simplest is the most fun. Each hit knocks a brick out of the wall, until a gap right through is produced, and then the ball can

Breakout untouched



demolish the wall from the back, but note that the bat goes down to half size as soon as the ball hits the rear wall and the ball speeds up on contact with the back three rows of bricks.

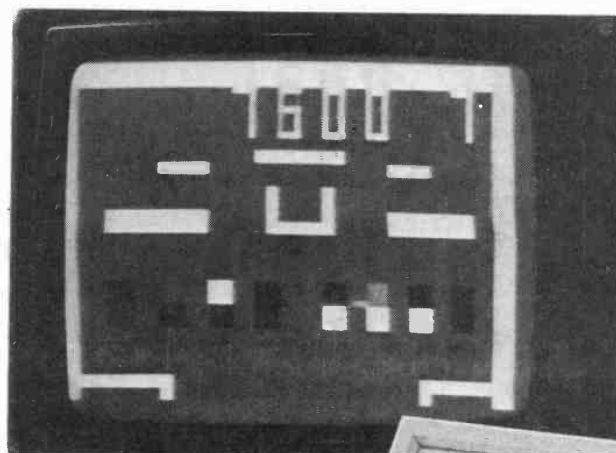
In addition the angle at which the ball deflects from the bat alters radically on the eighth 'hit' — just to keep things interesting. You have seven balls to remove two sets of walls, appearing consecutively, from the screen.

Two other versions provide small bat and only five balls with which to work.

Other Attractions

Rather than iterate every last little detail, we've used screen display photos to show the games and options available around those games. Pinball with a paddle is entertaining — to put it mildly!

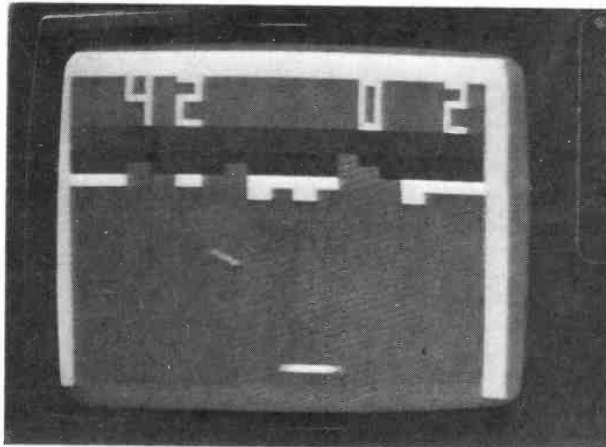
Solo basketball requires that you keep the ball bouncing on the bat,

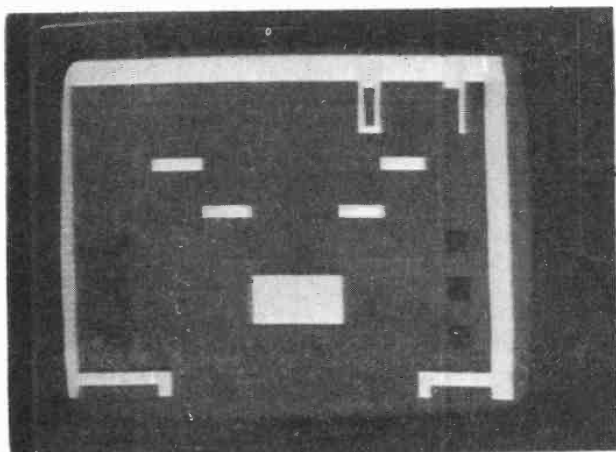


Pinball one underway!

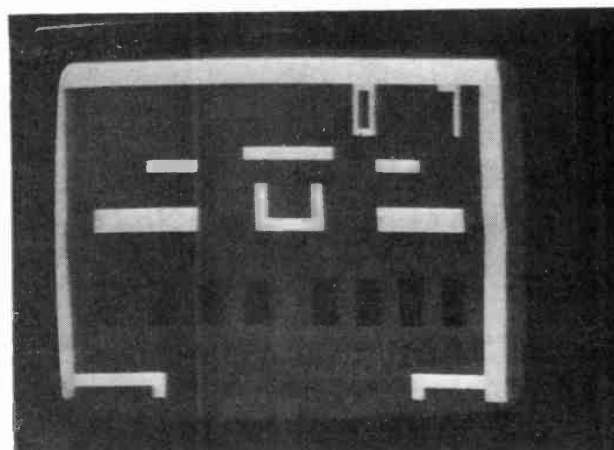


Breakout begun — and badly!





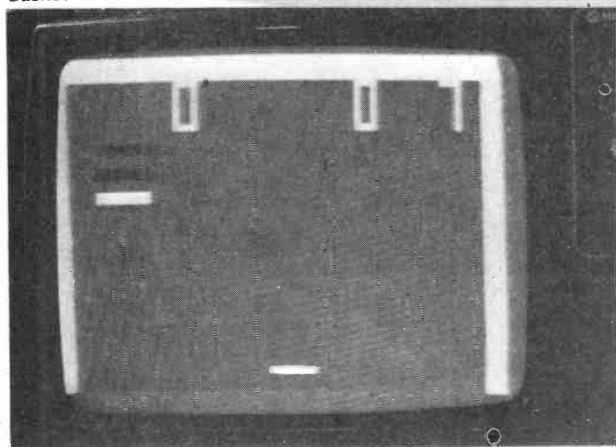
Pinball Two — four options



Pinball One — four options



Basketball



and then press the enter flipper button to "fire the ball upward to the targets. The longer the ball has been bounced on the bat, the more energy it possesses on firing.

No PSU is shown here, beyond a suggested circuit, because these 9V battery eliminators are available commercially at prices that probably make them cheaper to buy than build. If you must go it alone then this is not critical. All that is required is 9V at about 1.0mA or thereabouts.

Construction

There is no setting up to be done, apart from tuning your TV to channel 36. All the components mount onto the PCB, including the modulators, so building up the game should pose no problems at all. Use sockets for the ICs as the 'capital cost' is low compared to that for a new set of chips!

Mount up all the 'passives' first, then the modulators and Xtal. Test your 5V line before plugging in the ICs if possible. If all is well fit a UHF lead and plug into the aerial socket of the TV set. The signal should appear somewhere around channel 36, at which point the white noise will vanish and the first pinball game appear on the screen. The brightness and contrast may need adjusting to get the best display — use the breakout game for this. All three tones of brick should be clearly distinguished from one another.

Pressing game select should step the display through the range of games available, with Reset getting things under way. ►

HOW IT WORKS

As with all LSI based games, there is little outside the games chip package of which to speak. All the video sound and sync signals are generated within IC1. The 2112 RAM is provided to hold the 'game selected' signal and score. This is refreshed by IC1 whenever an increment is added by play. At the end of each game (in breakout and basketball) the final score is loaded for display on the screen during the next game. The pinball game scores would require too much screen space, and too many bits,

to store.

Q1 and associated circuitry regulate the 9V input from the external PSU to a stable 5V to drive the units' own circuitry. The clock frequency is set by XTAL1, C9, C11, and R14 forming a standard Xtal oscillator. IC3 is a 4019 Quad and/or multiplexer to interface SW1-SW6 with the select lines of IC1.

Paddle control RV1 is 'padded' by the 27k resistor to prevent a 'zero resistance' condition between the 5V line and IC1.

BUYLINES

NIC Models supply all the components for this project.

A complete kit is available for £28.95 all inclusive. Individual components may be purchased as follows:

PCB and Game Chip:

£19.90 all inc.

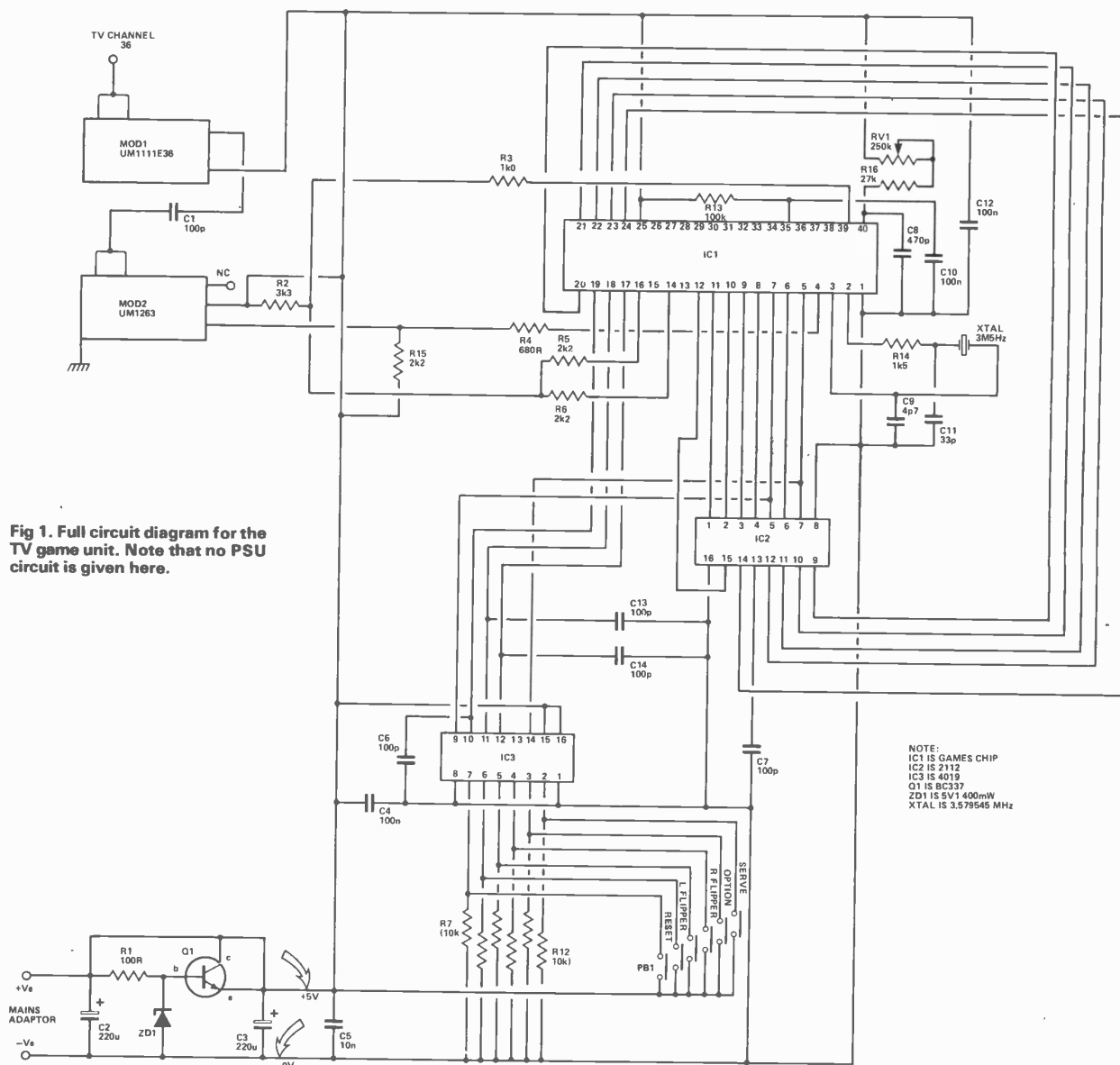
Modulators:

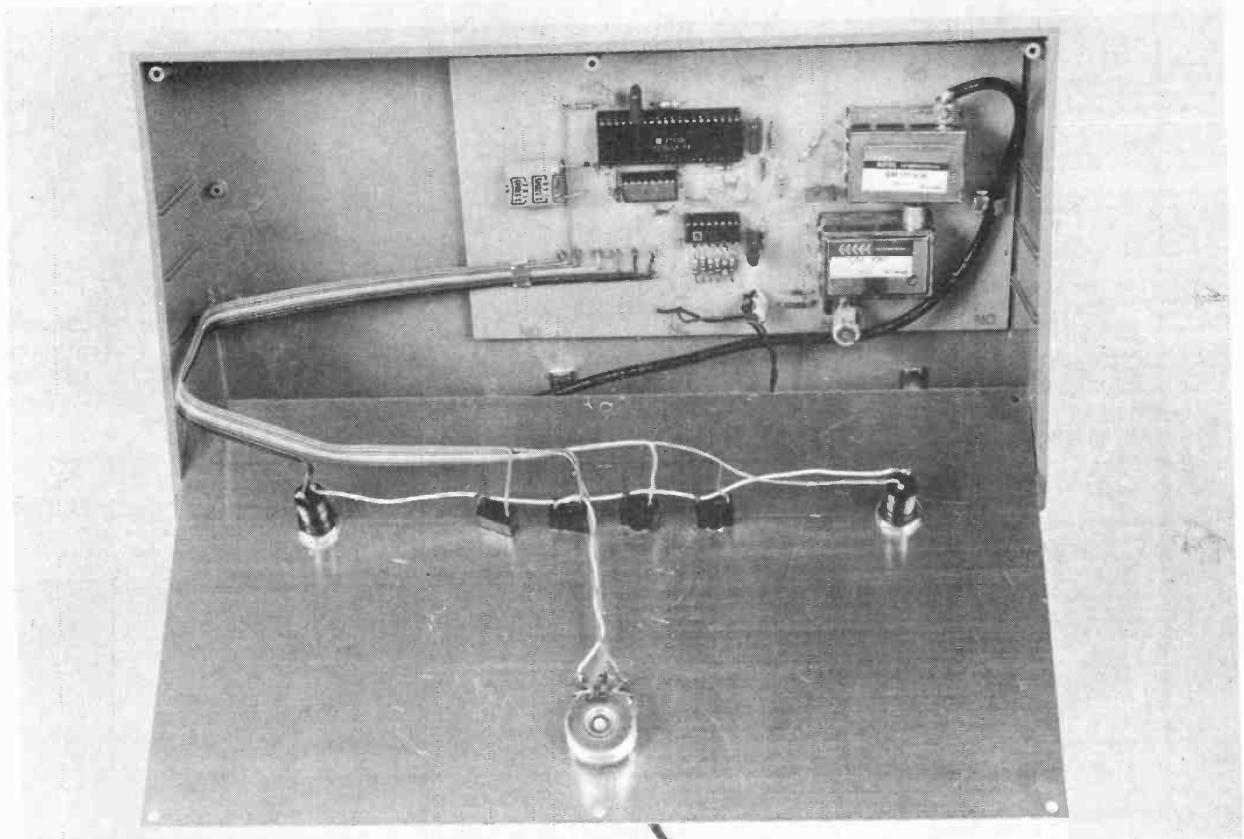
£5.80 pair

Xtal

£3.00 all inc.

The PCB is copyright NIC models and may not be obtained elsewhere. See ad elsewhere in this issue for ordering details. Likewise the chips (all 500 of them!) are initially single sourced.





internal view of the unit, showing the space left to mount a PSU board should you desire to power it this way.

PARTS LIST

RESISTORS		all ½W 5%
R1	100R	
R2	3k3	
R3	1k0	
R4	680R	
R5, 6, 15	2k2	
R7-12	10k	
R13	100k	
R14	1k5	
R16	27k	
CAPACITORS		
C1, 6, 7, 13, 14	100p polystyrene	
C2, 3	220u 16V electrolytic	
C4, 10, 12	100n polyester	
C5	10n polyester	
C8	470p polystyrene	
Ca	4p7 ceramic	
Cu	33p ceramic	
SEMICONDUCTORS		
IC1	See text	
IC2	2112	
IC3	4019	
Q1	BC 337	
ZD1	5V1 400mW	
MISCELLANEOUS		
XTAL (3.57 MHz)	Modulators	
RV1 (250k linear)	Box to suit	
PCB		

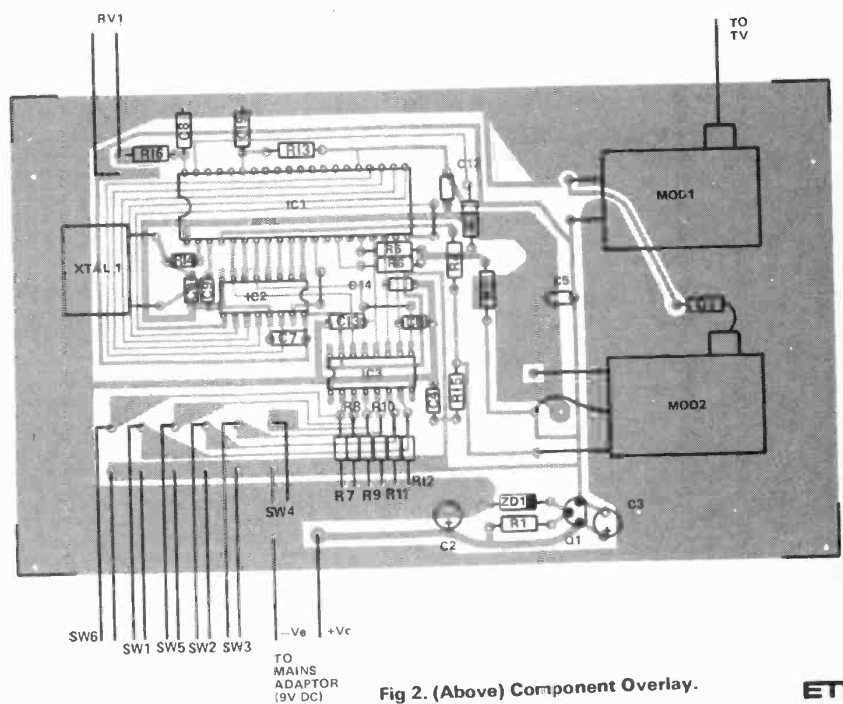


Fig 2. (Above) Component Overlay.

ETI

